

**CLAIMS:**

1. A method comprising:  
detecting a disablement of a passive optical network;  
storing address association information indicating association of network addresses with network clients upon detecting the disablement; and  
associating the network addresses and the network clients based on the stored address association information upon recovery from the disablement.
2. The method of claim 1, wherein associating the network addresses and the network clients includes:  
retrieving the stored address association information; and  
verifying whether the associations indicated by the address association information are valid.
3. The method of claim 2, wherein verifying whether the associations are valid includes:  
sending Address Resolution Protocol (ARP) queries for the network addresses indicated by the address association information; and  
maintaining the address associations upon receiving ARP responses.
4. The method of claim 3, wherein the address association information includes a remaining lease time, the method further comprising sending the ARP queries periodically for the remaining lease time for each of the address associations.
5. The method of claim 4, further comprising ceasing the sending of the ARP queries for one of the network addresses upon detecting a change in the address association information for the respective network address.
6. The method of claim 3, further comprising canceling the address association for one of the network addresses when an ARP response is not received for the respective network address within a predetermined period of time.

7. The method of claim 3, further comprising sending the ARP query to a network client associated with the network address.
8. The method of claim 2, further comprising modifying the address association information upon detecting a lease of one of the network addresses.
9. The method of claim 2, further comprising modifying the address association information upon detecting a renewal of one of the network addresses.
10. The method of claim 2, further comprising canceling one of the address associations upon detecting that one of the clients has released the respective network address.
11. The method of claim 1, further comprising:
  - tracking a length of time of the network disablement; and
  - updating remaining lease times of address association information in accordance with the length of time of the network disablement.
12. The method of claim 11, wherein tracking the length of time of the network disablement includes:
  - setting a timestamp upon detecting the network disablement; and
  - comparing the timestamp with a time indicated by a timing device to determine the length of time of the network disablement.
13. The method of claim 11, wherein updating remaining lease times includes subtracting the length of time of the network disablement from the remaining lease times.
14. The method of claim 12, further comprising canceling one of the associations when the remaining lease time for the respective association is shorter than the length of time of the network disablement.

15. The method of claim 1, wherein detecting a network disablement includes:  
sending periodic messages to communicate the state of the passive optical network;  
and  
concluding that a network disablement has occurred when a response to the periodic messages is not received with a predetermined period of time.
16. The method of claim 1, wherein the address association information includes a network address and a remaining lease time.
17. The method of claim 1, wherein storing network address association information includes storing the network address association information in non-volatile memory.
18. The method of claim 1, wherein the network addresses include Internet Protocol (IP) addresses.
19. The method of claim 1, further comprising leasing the network addresses to clients for a specified duration of time.
20. A computer-readable medium comprising instructions to cause a processor to:  
detect a disablement of a passive optical network;  
store address association information indicating association of network addresses with network clients upon detecting the disablement; and  
associate the network addresses and the network clients based on the stored address association information upon recovery from the disablement.

21. A method comprising:
  - retrieving stored address association information indicating association of network addresses with network clients upon recovery of a passive optical network from a disablement;
  - associating the network addresses to clients based on the stored address association information;
  - sending ARP queries for the network addresses indicated in the address association information; and
  - maintaining the associations upon receiving ARP responses for the network addresses.
22. The method of claim 21, wherein sending ARP queries for the network addresses indicated in the address association information includes periodically sending ARP queries for the network addresses for a period of time.
23. The method of claim 22, wherein the period of time includes a remaining lease time indicated for each of the network addresses in address association information.
24. The method of claim 21, further comprising:
  - updating the address association information for at least one of the network addresses;
  - and
  - ceasing the ARP queries for network addresses that have association information that was updated.
25. The method of claim 21, further comprising canceling the association of a network address to a client upon expiration of a remaining lease time.
26. The method of claim 21, further comprising:
  - detecting a lease modification message; and
  - updating the association information upon detecting a modification message.

27. The method of claim 26, wherein the lease modification message includes at least one of an acknowledge message indicating a new lease of one of the network addresses, a renewal message indicating a new lease time for a network address, and a client release message indicating that one of the clients has released one of the leased addresses.

28. A computer-readable medium comprising instructions to cause a processor to:

- retrieve stored address association information indicating association of network addresses with network clients upon recovery of a passive optical network from a disablement;
- associate the network addresses to clients based on the stored address association information;
- send ARP queries for the network addresses indicated in the address association information; and
- maintain the associations upon receiving ARP responses for the network addresses.

29. A method comprising:

- retrieving stored address association information upon recovery of a passive optical network from a disablement;
- determining a length of time of the disablement;
- updating remaining lease times indicated by the address association information in accordance with the determined length of time of the network disablement; and
- associating the network addresses to the network clients in accordance with the updated address association information.

30. The method of claim 29, wherein determining the length of time of the network disablement includes:

- setting a timestamp upon detecting the network disablement; and
- comparing the timestamp with a timing device to determine the length of time of the network disablement.

31. The method of claim 29, wherein updating the remaining lease times includes subtracting the length of time of the network disablement from the remaining lease time.
32. The method of claim 29, further comprising canceling the association from the address association information when the remaining lease time is shorter than the length of time of the network disablement.
33. The method of claim 29, wherein the network addresses include Internet Protocol (IP) addresses.
34. The method of claim 29, further comprising:
  - detecting a network disablement of a passive optical network; and
  - storing address association information upon detecting a network disablement.
35. The method of claim 29, further comprising canceling the association of a network address to a client upon the remaining lease time expiring.
36. A computer-readable medium comprising instructions to cause a processor to:
  - retrieve stored address association information indicating association of network addresses with network clients upon recovery of a passive optical network from a disablement;
  - associate the network addresses to clients based on the stored address association information;
  - send ARP queries for the network addresses indicated in the address association information; and
  - maintain the associations upon receiving ARP responses for the network addresses.

37. A passive optical network comprising:  
a network node that represents at least one client;  
an interface that transmits information to the network node via an optical fiber link;  
and  
a set of address association information associated with the network node that associates network addresses to the clients represented by the node upon recovery of the passive optical network from a disablement.
38. The passive optical network of claim 37, wherein the network node stores the set of address association information in a non-volatile memory upon detecting the passive optical network disablement.
39. The passive optical network of claim 37, wherein the address association information includes assigned network addresses and a remaining lease time of the assigned network address.
40. The passive optical network of claim 39, wherein the network node sends an ARP query the network addresses to the associated client for the duration of the remaining lease time indicated by the address association information.
41. The passive optical network of claim 37, further comprising a timing device.
42. The passive optical network of claim 41, wherein the network node compares a timestamp with a time indicated by the timing device to determine the length of time of the network disablement.

43. A passive optical network device comprising:  
means for detecting a disablement of a passive optical network;  
means for storing address association information indicating association of network addresses with network clients upon detecting the disablement; and  
means for associating the network addresses and the network clients based on the stored address association information upon recovery from the disablement.
44. The device of claim 43, wherein associating the network addresses and the network clients includes:  
means for retrieving the stored address association information; and  
means for verifying whether the associations indicated by the address association information are valid.
45. The device of claim 44, wherein the means for verifying whether the associations are valid includes:  
means for sending Address Resolution Protocol (ARP) queries for the network addresses indicated by the address association information; and  
means for maintaining the address associations upon receiving ARP responses.
46. The device of claim 45, wherein the address association information includes a remaining lease time, wherein means for sending the ARP queries periodically sends the ARP queries for the remaining lease time for each of the address associations.
47. The device of claim 45, wherein the means for sending the ARP queries ceases the sending of the ARP queries for one of the network addresses upon detecting a change in the address association information for the respective network address.
48. The device of claim 45, further comprising means for canceling the address association for one of the network addresses when an ARP response is not received for the respective network address within a predetermined period of time.



49. The device of claim 45, further comprising means for sending the ARP query to a network client associated with the network address.

50. The device of claim 44, further comprising means for modifying the address association information upon detecting a lease of one of the network addresses.

51. The device of claim 44, further comprising means for modifying the address association information upon detecting a renewal of one of the network addresses.

52. The device of claim 44, further comprising means for canceling one of the address associations upon detecting that one of the clients has released the respective network address.

53. The device of claim 43, further comprising:  
means for tracking a length of time of the network disablement; and  
means for updating remaining lease times of address association information in accordance with the length of time of the network disablement.

54. The device of claim 53, wherein the means for tracking the length of time of the network disablement sets a timestamp upon detecting the network disablement, and compares the timestamp with a time indicated by a timing device to determine the length of time of the network disablement.

55. The device of claim 43, wherein the address association information includes a network address and a remaining lease time.

56. The device of claim 43, wherein the network addresses include Internet Protocol (IP) addresses.